EPA KEY CONTACTS FORM

OMB Number: 2030-0020
Expiration Date: 06/30/2024

Authorized Representative: *Original awards and amendments will be sent to this individual for review and acceptance, unless otherwise indicated.*

Name: Prefix: | First Name: Raymond | Middle Name: Louis
Last Name: Bronner | Suffix:
Title: Contracts Manager/Staff Attorney

Complete Address:

Street1: 2000 Ninth Avenue South
Street2:
City: Birmingham | State: AL: Alabama
Zip / Postal Code: 35205 | Country: USA: UNITED STATES
Phone Number: 205-581-2873 | **Fax Number:**
E-mail Address: rbronner@southernresearch.org

Payee: *Individual authorized to accept payments.*

Name: Prefix: | First Name: Joy | Middle Name:
Last Name: Andrews | Suffix:
Title: Senior Accountant

Complete Address:

Street1: 2000 Ninth Avenue South
Street2:
City: Birmingham | State: AL: Alabama
Zip / Postal Code: 35205 | Country: USA: UNITED STATES
Phone Number: 205-581-2003 | **Fax Number:**
E-mail Address: jandrews@southernresearch.org

Administrative Contact: *Individual from Sponsored Programs Office to contact concerning administrative matters (i.e., indirect cost rate computation, rebudgeting requests etc).*

Name: Prefix: | First Name: Raymond | Middle Name: Louis
Last Name: Bronner | Suffix:
Title: Contracts Manager/Staff Attorney

Complete Address:

Street1: 2000 Ninth Avenue South
Street2:
City: Birmingham | State: AL: Alabama
Zip / Postal Code: 35205 | Country: USA: UNITED STATES
Phone Number: 205-581-2873 | **Fax Number:**
E-mail Address: rbronner@southernresearch.org

EPA Form 5700-54 (Rev 4-02)

EPA KEY CONTACTS FORM

Project Manager: *Individual responsible for the technical completion of the proposed work.*

Name: Prefix: | First Name: Alyssa | Middle Name:

Last Name: McQuilling | Suffix:

Title: Engineering Project Leader

Complete Address:

Street1: 2000 Ninth Avenue South

Street2:

City: Birmingham | State: AL: Alabama

Zip / Postal Code: 35205 | Country: USA: UNITED STATES

Phone Number: 205-581-2266 | **Fax Number:**

E-mail Address: rbronner@southernresearch.org

Other Attachment File(s)

*** Mandatory Other Attachment Filename:** 1235-Southern Research IRS Exemption Status Ltr 20

Add Mandatory Other Attachment | Delete Mandatory Other Attachment | View Mandatory Other Attachment

To add more "Other Attachment" attachments, please use the attachment buttons below.

Add Optional Other Attachment | Delete Optional Other Attachment | View Optional Other Attachment

OMB Number: 2030-0020
Expiration Date: 06/30/2024

Preaward Compliance Review Report for All Applicants and Recipients Requesting EPA Financial Assistance

Note: Read Instructions before completing form.

I. A. Applicant/Recipient (Name, Address, City, State, Zip Code)

Name: Southern Research Institute

Address: 2000 Ninth Avenue South

City: Birmingham

State: AL: Alabama Zip Code: 35205-2708

B. DUNS No. 006900526

II. Is the applicant currently receiving EPA Assistance? ☐ Yes ☒ No

III. List all civil rights lawsuits and administrative complaints pending against the applicant/recipient that allege discrimination based on race, color, national origin, sex, age, or disability. (Do not include employment complaints not covered by 40 C.F.R. Parts 5 and 7.)

None

IV. List all civil rights lawsuits and administrative complaints decided against the applicant/recipient within the last year that allege discrimination based on race, color, national origin, sex, age, or disability and enclose a copy of all decisions. Please describe all corrective actions taken. (Do not include employment complaints not covered by 40 C.F.R. Parts 5 and 7.)

None

V. List all civil rights compliance reviews of the applicant/recipient conducted by any agency within the last two years and enclose a copy of the review and any decisions, orders, or agreements based on the review. Please describe any corrective action taken. (40 C.F.R. § 7.80(c)(3))

None

VI. Is the applicant requesting EPA assistance for new construction? If no, proceed to VII; if yes, answer (a) and/or (b) below.

☐ Yes ☒ No

a. If the grant is for new construction, will all new facilities or alterations to existing facilities be designed and constructed to be readily accessible to and usable by persons with disabilities? If yes, proceed to VII; if no, proceed to VI(b).

☐ Yes ☐ No

b. If the grant is for new construction and the new facilities or alterations to existing facilities will not be readily accessible to and usable by persons with disabilities, explain how a regulatory exception (40 C.F.R. 7.70) applies.

VII. Does the applicant/recipient provide initial and continuing notice that it does not discriminate on the basis of race, color, national origin, sex, age, or disability in its program or activities? (40 C.F.R 5.140 and 7.95)	☒ Yes	☐ No
a. Do the methods of notice accommodate those with impaired vision or hearing?	☒ Yes	☐ No
b. Is the notice posted in a prominent place in the applicant's offices or facilities or, for education programs and activities, in appropriate periodicals and other written communications?	☒ Yes	☐ No
c. Does the notice identify a designated civil rights coordinator?	☒ Yes	☐ No
VIII. Does the applicant/recipient maintain demographic data on the race, color, national origin, sex, age, or handicap of the population it serves? (40 C.F.R. 7.85(a))	☒ Yes	☐ No
IX. Does the applicant/recipient have a policy/procedure for providing access to services for persons with limited English proficiency? (40 C.F.R. Part 7, E.O. 13166)	☐ Yes	☒ No

X. If the applicant is an education program or activity, or has 15 or more employees, has it designated an employee to coordinate its compliance with 40 C.F.R. Parts 5 and 7? Provide the name, title, position, mailing address, e-mail address, fax number, and telephone number of the designated coordinator.

Yes. Stephanie Coulter, Director Human Resources, 2000 Ninth Avenue South, Birmingham, Alabama 35205-2708, scoulter@southernresearch.org, Ph: 205-581-2250, Fax: 205-581-2713

XI. If the applicant is an education program or activity, or has 15 or more employees, has it adopted grievance procedures that assure the prompt and fair resolution of complaints that allege a violation of 40 C.F.R. Parts 5 and 7? Provide a legal citation or Internet Address for, or a copy of, the procedures.

Yes. See other attachments, Dispute-Resolution, and Open-Door-Policy.

For the Applicant/Recipient

I certify that the statements I have made on this form and all attachments thereto are true, accurate and complete. I acknowledge that any knowingly false or misleading statement may be punishable by fine or imprisonment or both under applicable law. I assure that I will fully comply with all applicable civil rights statutes and EPA regulations.

A. Signature of Authorized Official	B. Title of Authorized Official	C. Date
Raymond L Bronner	Contracts Manager/Staff Attorney	03/25/2022

For the U.S. Environmental Protection Agency

I have reviewed the information provided by the applicant/recipient and hereby certify that the applicant/recipient has submitted all preaward compliance information required by 40 C.F.R. Parts 5 and 7; that based on the information submitted, this application satisfies the preaward provisions of 40 C.F.R. Parts 5 and 7; and that the applicant has given assurance that it will fully comply with all applicable civil rights statures and EPA regulations.

A. *Signature of Authorized EPA Official	B. Title of Authorized Official	C. Date

*** See Instructions**

Instructions for EPA FORM 4700-4 (Rev. 06/2014)

General. Recipients of Federal financial assistance from the U.S. Environmental Protection Agency must comply with the following statutes and regulations.
Title VI of the Civil Rights Acts of 1964 provides that no person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance. The Act goes on to explain that the statute shall not be construed to authorize action with respect to any employment practice of any employer, employment agency, or labor organization (except where the primary objective of the Federal financial assistance is to provide employment). Section 13 of the 1972 Amendments to the Federal Water Pollution Control Act provides that no person in the United States shall on the ground of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under the Federal Water Pollution Control Act, as amended. Employment discrimination on the basis of sex is prohibited in all such programs or activities. Section 504 of the Rehabilitation Act of 1973 provides that no otherwise qualified individual with a disability in the United States shall solely by reason of disability be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance. Employment discrimination on the basis of disability is prohibited in all such programs or activities. The Age Discrimination Act of 1975 provides that no person on the basis of age shall be excluded from participation under any program or activity receiving Federal financial assistance. Employment discrimination is not covered. Age discrimination in employment is prohibited by the Age Discrimination in Employment Act administered by the Equal Employment Opportunity Commission. Title IX of the Education Amendments of 1972 provides that no person in the United States on the basis of sex shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance. Employment discrimination on the basis of sex is prohibited in all such education programs or activities. Note: an education program or activity is not limited to only those conducted by a formal institution. 40 C.F.R. Part 5 implements Title IX of the Education Amendments of 1972. 40 C.F.R. Part 7 implements Title VI of the Civil Rights Act of 1964, Section 13 of the 1972 Amendments to the Federal Water Pollution Control Act, and Section 504 of The Rehabilitation Act of 1973. The Executive Order 13166 (E.O. 13166) entitled; "Improving Access to Services for Persons with Limited English Proficiency" requires Federal agencies work to ensure that recipients of Federal financial assistance provide meaningful access to their LEP applicants and beneficiaries.

Items "Applicant" means any entity that files an application or unsolicited proposal or otherwise requests EPA assistance. 40 C.F.R. §§ 5.105, 7.25. "Recipient" means any entity, other than applicant, which will actually receive EPA assistance. 40 C.F.R. §§ 5.105, 7.25. "Civil rights lawsuits and administrative complaints" means any lawsuit or administrative complaint alleging discrimination on the basis of race, color, national origin, sex, age, or disability pending or decided against the applicant and/or entity which actually benefits from the grant, but excluding employment complaints not covered by 40 C.F.R. Parts 5 and 7. For example, if a city is the named applicant but the grant will actually benefit the Department of Sewage, civil rights lawsuits involving both the city and the Department of Sewage should be listed. "Civil rights compliance review" means any review assessing the applicant's and/or recipient's compliance with laws prohibiting discrimination on the basis of race, color, national origin, sex, age, or disability. Submit this form with the original and required copies of applications, requests for extensions, requests for increase of funds, etc. Updates of information are all that are required after the initial application submission. If any item is not relevant to the project for which assistance is requested, write "NA" for "Not Applicable." In the event applicant is uncertain about how to answer any questions, EPA program officials should be contacted for clarification. * Note: Signature appears in the Approval Section of the EPA Comprehensive Administrative Review For Grants/Cooperative Agreements & Continuation/Supplemental Awards form.

Project Narrative File(s)

*** Mandatory Project Narrative File Filename:** 1234-EPA OAQPS Enhanced AQ Monitoring - Southern Resea

Add Mandatory Project Narrative File | Delete Mandatory Project Narrative File | View Mandatory Project Narrative File

To add more Project Narrative File attachments, please use the attachment buttons below.

Add Optional Project Narrative File | Delete Optional Project Narrative File | View Optional Project Narrative File

BUDGET INFORMATION - Non-Construction Programs

OMB Number: 4040-0006
Expiration Date: 02/28/2022

SECTION A - BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. Enhanced Air Quality Monitoring for Communities	66.034	$	$	$ 437,889.00	$ 0.00	$ 437,889.00
2.						
3.						
4.						
5. Totals		$	$	$ 437,889.00	$ 0.00	$ 437,889.00

Standard Form 424A (Rev. 7- 97)
Prescribed by OMB (Circular A -102) Page 1

SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY (1) Enhanced Air Quality Monitoring for Communities	(2)	(3)	(4)	Total (5)
a. Personnel	$ 51,444.00	$	$	$	$ 51,444.00
b. Fringe Benefits	22,738.00				22,738.00
c. Travel	0.00				0.00
d. Equipment	86,318.00				86,318.00
e. Supplies	80,063.00				80,063.00
f. Contractual	0.00				0.00
g. Construction	0.00				0.00
h. Other	30,637.00				30,637.00
i. Total Direct Charges (sum of 6a-6h)	271,200.00				$ 271,200.00
j. Indirect Charges	166,689.00				$ 166,689.00
k. TOTALS (sum of 6i and 6j)	$ 437,889.00	$	$	$	$ 437,889.00
7. Program Income	$ 0.00	$	$	$	$ 0.00

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Prescribed by OMB (Circular A -102) Page 1A

SECTION C - NON-FEDERAL RESOURCES

(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e)TOTALS
8. Enhanced Air Quality Monitoring for Communities	$ 0.00	$	$	$ 0.00
9.				
10.				
11.				
12. TOTAL (sum of lines 8-11)	$ 0.00	$	$	$ 0.00

SECTION D - FORECASTED CASH NEEDS

	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	$ 185,331.00	$ 23,104.00	$ 59,872.00	$ 71,193.00	$ 31,162.00
14. Non-Federal	$				
15. TOTAL (sum of lines 13 and 14)	$ 185,331.00	$ 23,104.00	$ 59,872.00	$ 71,193.00	$ 31,162.00

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT

(a) Grant Program	FUTURE FUNDING PERIODS (YEARS) (b)First	(c) Second	(d) Third	(e) Fourth
16. Enhanced Air Quality Monitoring for Communities	$ 185,331.00	$ 124,647.00	$ 127,911.00	$ 0.00
17.				
18.				
19.				
20. TOTAL (sum of lines 16 - 19)	$ 185,331.00	$ 124,647.00	$ 127,911.00	$ 0.00

SECTION F - OTHER BUDGET INFORMATION

21. Direct Charges:

22. Indirect Charges:

23. Remarks: Other direct costs (line h) include: cloud data services, and rentals, supplies and logistics for community meetings. Indirect costs include: OH = 120%* (Salaries+Fringe); G&A = 20%*(Salaries+Fringe+OH+ODCs); CFC = (7.1%*OH base) + (0.1%*G&A base)

OMB Number: 4040-0004
Expiration Date: 12/31/2022

Application for Federal Assistance SF-424

* 1. Type of Submission:
- [ ] Preapplication
- [x] Application
- [ ] Changed/Corrected Application

* 2. Type of Application:
- [x] New
- [ ] Continuation
- [ ] Revision

* If Revision, select appropriate letter(s):

* Other (Specify):

* 3. Date Received: 03/25/2022

4. Applicant Identifier: Southern Research Institute

5a. Federal Entity Identifier:

5b. Federal Award Identifier:

State Use Only:

6. Date Received by State:

7. State Application Identifier: AL

8. APPLICANT INFORMATION:

* a. Legal Name: Southern Research Institute

* b. Employer/Taxpayer Identification Number (EIN/TIN): 630288868

* c. Organizational DUNS: 0069005260000

d. Address:

* Street1: 2000 Ninth Avenue South
Street2:
* City: Birmingham
County/Parish: AL
* State: AL: Alabama
Province:
* Country: USA: UNITED STATES
* Zip / Postal Code: 35205-2708

e. Organizational Unit:

Department Name:

Division Name:

f. Name and contact information of person to be contacted on matters involving this application:

Prefix:
* First Name: Raymond
Middle Name: Louis
* Last Name: Bronner
Suffix:

Title:

Organizational Affiliation: Southern Research Institute

* Telephone Number: 2055812873
Fax Number:

* Email: rbronner@southernresearch.org

Application for Federal Assistance SF-424

*** 9. Type of Applicant 1: Select Applicant Type:**

M: Nonprofit with 501C3 IRS Status (Other than Institution of Higher Education)

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

* Other (specify):

*** 10. Name of Federal Agency:**

Environmental Protection Agency

11. Catalog of Federal Domestic Assistance Number:

66.034

CFDA Title:

Surveys, Studies, Research, Investigations, Demonstrations, and Special Purpose Activities Relating to the Clean Air Act

*** 12. Funding Opportunity Number:**

EPA-OAR-OAQPS-22-01

* Title:

Enhanced Air Quality Monitoring for Communities

13. Competition Identification Number:

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

Add Attachment | Delete Attachment | View Attachment

*** 15. Descriptive Title of Applicant's Project:**

Understanding and Evaluating Neighborhood-level variation in criteria pollutant levels in North Birmingham and Birmingham's West End

Attach supporting documents as specified in agency instructions.

Add Attachments | Delete Attachments | View Attachments

Application for Federal Assistance SF-424

16. Congressional Districts Of:

* a. Applicant: AL-007 * b. Program/Project: AL-007

Attach an additional list of Program/Project Congressional Districts if needed.

Add Attachment | Delete Attachment | View Attachment

17. Proposed Project:

* a. Start Date: 12/01/2022 * b. End Date: 12/31/2025

18. Estimated Funding ($):

* a. Federal	437,889.00
* b. Applicant	0.00
* c. State	0.00
* d. Local	0.00
* e. Other	0.00
* f. Program Income	0.00
* g. TOTAL	437,889.00

*** 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**

☐ a. This application was made available to the State under the Executive Order 12372 Process for review on .

☐ b. Program is subject to E.O. 12372 but has not been selected by the State for review.

☒ c. Program is not covered by E.O. 12372.

*** 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes," provide explanation in attachment.)**

☐ Yes ☒ No

If "Yes", provide explanation and attach

Add Attachment | Delete Attachment | View Attachment

21. *By signing this application, I certify (1) to the statements contained in the list of certifications and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)**

☒ ** I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix: * First Name: Raymond

Middle Name: Louis

* Last Name: Bronner

Suffix:

* Title: Contracts Manager/Staff Attorney

* Telephone Number: 2055812873 Fax Number:

* Email: rbronner@southernresearch.org

* Signature of Authorized Representative: Raymond L Bronner * Date Signed: 03/25/2022

Enhanced Air Quality Monitoring for Communities: Understanding and Evaluating Neighborhood-level variation in criteria pollutant levels in North Birmingham and Birmingham's West End

RFA NUMBER:	EPA-OAR-OAQPS-22-01
Assistance Listing No:	66.034
Applicant Organization:	Southern Research, Energy and Environment Division 2000 Ninth Ave S Birmingham, AL 35205

Quality Assurance Statement

This document provides a brief description of the quality assurance and quality control practices that will be used in the project, as required by the RFA.

The project team will work closely so that quality assurance and quality control activities will result in high quality and defensible air quality monitoring data for the location specified in our application. The Southern Research project manager (Alyssa McQuilling) will work closely with the quality assurance department at Southern Research (led by Lori Wright) to develop an in-depth quality assurance project plan if this project is selected.

Quality assurance begins with the planning and implementation of the monitoring strategy. We will work closely with the air quality sensor supplier to determine the best practices for both siting and installation of the selected monitors. This will include determination of the spacing of the monitors (i.e. how far apart they are) and the height of installation to create the best network of nodes to provide insights to localized exposures. We will also work closely with the North Birmingham Implementation Committee to make sure that the locations selected for installation will work for the community and be in locations that are not disruptive to community activities. Once the equipment described in the proposal has been procured and installed, we will work with the supplier to calibrate the system according to their own best practices. The North Birmingham Study site is the location of Jefferson County Department of Health Air Quality monitor which can assist with setting the baseline for our own observations. The calibration of the equipment will be reviewed against nearby monitoring data on a recurring basis to ensure that if errors occur we address them sooner rather than later. The team expects regular maintenance to be a part of the operation, particularly for the gas sensors that are proposed for this study. These will likely need to be replaced on an annual basis and the costs for regular maintenance and repairs have been included in our estimates for sensor and equipment costs.

Throughout the completion of the proposed project, we will work together to check the data collection process and confirm data quality. This will include both regular calibrations and precision checks in alignment with the best practices provided by the equipment supplier. In addition to calibration and precision checks of the equipment, regular data review will be conducted to identify any equipment malfunctions that would result in data losses. System status will be checked on a daily basis with plans to check data completeness and reasonableness on a weekly basis for real-time monitors; in addition, as a result of our plans to enable community viewing of data through an online platform, constituents can report any observed issues as they are uncovered.

Based on available documentation of the types of monitoring equipment we have proposed to use, we have a benchmark for the expected accuracy. For the particulate matter sensors, we expect a mean average error of 1-1.5 $\mu g/m^3$ for fine particulate matter ($PM_{2.5}$) at a 1-hour time resolution (error based on reference measurements); error is expected to be greater for smaller particles (up to approximately 3 $\mu g/m^3$). Gas sensors, depending on chemical species are expected to be accurate to a few ppb; we expect to monitor the performance of gas sensors closely as their performance is known to degrade over time. We expect some of the sensors to be replaced on an annual basis (especially NO_x).

Our goal is to successfully complete the research project and obtain documented quality data that can be used to improve the lives of the citizens of Birmingham through better understanding of air quality and pollutant exposure. Per the RFA and as detailed in 2 CFR §1500.12, a full quality assurance project plan will be developed prior to award if this proposal is selected.

JEFFERSON COUNTY DEPARTMENT OF HEALTH
1400 6th Avenue South | Birmingham, AL 35233 (205) 933-9110 | www.jcdh.org
Serving Jefferson County Since 1917

Mark E. Wilson
Health Officer

March 25, 2022

Reviewers for the Enhanced Air Quality Monitoring for Communities RFA
Environmental Protection Agency
Office of Air and Radiation
1200 Pennsylvania Ave NW
Washington, DC 20460

To Whom It May Concern:

As Jefferson County Health Officer and chief executive of the Jefferson County Department of Health (JCDH), I support the proposal entitled "Enhanced Air Quality Monitoring for Communities: Understanding and Evaluating Neighborhood-level variation in criteria pollutant levels in North Birmingham and Birmingham's West End" submitted in response to the EPA's Enhanced Air Quality Monitoring for Communities Request for Applications. Grant studies such as this provide supplemental data that helps complement JCDH's comprehensive air pollution strategy, which has helped reduce air pollution throughout Jefferson County, AL over the last several years. Study data can also help to further characterize air pollutants in specific areas such as North or Southwest Birmingham.

Our Department conducts air pollution reduction strategies through: 1) the use of data from two continuous monitors located in the North Birmingham community that monitor all criteria air pollutants (PM, Ozone, NOx, SOx, CO, Pb) and VOCs (including Benzene); 2) results of two previous air toxics studies that were conducted in cooperation with the EPA; 3) incorporation of EPA environmental justice procedures into permitting; and 4) FLIR inspections in both North and Southwest Birmingham. In addition, JCDH participates with City of Birmingham staff in their environmental and health related efforts related to the community-based framework plans in both of these target areas. Expertise from our Air Pollution Control staff helped guide the placement of this proposed study.

Thank you for considering this application.

Sincerely,

MEW MD

Mark E. Wilson, MD

Alyssa M. McQuilling

Ex. 6 Personal Privacy (PP)

Education

PhD, Civil and Environmental Engineering, Carnegie Mellon University, 2016
MS, Civil and Environmental Engineering, Carnegie Mellon University, 2012
BS, Environmental Engineering, North Carolina State University, 2010

Research and Professional Experience

Project Lead, Energy & Env.	Southern Research	April 2020 – Present
Adv. Environmental Engr.	Southern Research	Feb. 2016 – April 2020
Graduate Research Assistant	Carnegie Mellon University	Aug. 2010 – Feb. 2016
Graduate Teaching Assistant	Carnegie Mellon University	Jan. 2011 – Dec. 2014

Dr. McQuilling has 10 years of experience in research and engineering in with a demonstrated history of working in air quality engineering, air quality modeling, energy storage, and the food-energy-water nexus. Skilled in project management, energy storage testing and development, market research/survey development, environmental engineering, sustainability, statistics, air quality modeling, and health/environmental impacts.

Publications

Ayipio, E., Wells, D.E., **McQuilling, A**. and Wilson, A.E., 2019. Comparisons between aquaponic and conventional hydroponic crop yields: A meta-analysis. Sustainability, 11(22), p.6511.

B. Taube, R. Johnson, P. Leufkens, C. Thompson, and **A. McQuilling, "**Real-time simulation and data analytics for grid-scale energy storage applications in the Southeast," in *TechConnect Briefs*, 2018.

B. Taube, P. Leufkens, C. Thompson, and **A. McQuilling,** "Identifying key applications for cost-effective deployment of energy storage systems in the Southeastern United States," in *TechConnect Briefs*, 2018.

B. Taube, P. Leufkens, C. Thompson, and **A. McQuilling, "**Energy Storage Standards Development and Defining Best Practices for System Evaluation," in *TechConnect Briefs*, 2018.

McQuilling AM., Adams PJ, "Development of a process-based model to estimate ammonia emissions from livestock operations in the United States." Atmospheric Environment: Volume 120: 127-136. 2015.

Selected Conference Presentations

AM McQuilling, R DiFelice, A Foukal, L Meeks, S Ranade, J Rogol, moderated by JL Spilman. Energy Storage in the Southeast—From Short Term Batteries to Long-Term Storage and Green Hydrogen. Southeast Renewable Energy. Charlotte, NC. November 16-18, 2021.

McQuilling, AM, G Styers, PL Hinerman, T Norris, J Glassmire. Identifying Opportunities and Risks for Battery Storage Projects. American Bar Association Annual Meeting. Virtual Event. September 2020.

McQuilling, A.M., Lawson, J., Mukhtar, S., Grieco, W.G. Intensive aquatic protein production using duckweed as a model platform. Oral Pres. ACS National Meeting. San Francisco, CA. April 3-7, 2017.

McQuilling AM, Adams PJ. "Creating and Evaluating a New National Inventory for Livestock Ammonia Emissions in the United States." Platform presentation at the American Association for Aerosol Research, 34th Annual Conference, Minneapolis, MN. October 2015.

McQuilling AM, Adams PJ. "Modeling livestock ammonia emissions in the United States: From farms to emissions to particulate matter." Emissions Inventory Conference, US EPA, San Diego, CA. April 2015.

Synergistic Activities

President, United Ability Junior Board (2020-2021); Finance Officer, AAUW-Birmingham, (2019-Present); Reviewer for *Atmospheric Environment* (2016 – Present); Member and Symposium Organizer for the American Chemical Society (2017 – Present); Member, AAAR, (2012-2016)

Thomas Yuill

1000 53rd Street South | Birmingham, AL 35213
Cell: (334) 744-0452 | thomyuill@gmail.com
www.linkedin.com/in/tyuill

SUMMARY

- Master of Public Affairs with six years planning experience, including working with the public and developing and reviewing plans for compliance and quality
- Strong background managing projects to improve public outcomes

EDUCATION

Master of Public Affairs, *Indiana University South Bend* — South Bend, IN
Government Affairs Focus; GPA - 3.93 — May 2014

Professional GIS Certificate, Michigan State University — Lansing, MI
May 2018

Bachelor of Arts in Psychology, *Auburn University* — Auburn, AL
GPA: 3.59 — *Cum Laude* — May 2011

SELECTED EXPERIENCE

Senior Planner — 1/2020 - Present
City of Birmingham, Birmingham AL

- Develops modifications to planning regulations, including signage and parking requirements
- Co-manages the Southern Area Framework Plan, a community-level comprehensive planning effort
- Meets with elected officials, the public, developers, and other stakeholders regarding planning efforts
- Works to improve connection between land use and transportation, including improving bus stop design and shelter installation process
- Works to implement sustainability measures within City operations, including development of the first greenhouse gas emissions inventory and researching vacant lot green activation

Principal Planner (promoted from Senior Planner 11/2018) — 5/2016 - 1/2020
Birmingham Jefferson County Transit Authority, Birmingham AL

- Planned, implemented, and monitored transit service for region
- Worked extensively creating and reading maps and designs in a variety of formats, such as ArcGIS
- Verified plans fit federal regulations and Union contract requirements; monitored new guidelines and regulations to ensure continued compliance
- Worked with neighborhood leaders, citizen advisory boards, elected officials, technical staff, union representatives, and others to improve public services
- Scheduled, organized, and presented at public meetings; engaged with public to guide decision making
- Managed projects to address community and neighborhood needs (new bus routes, public bus tracking, etc.)
- Designed and managed data collection and analysis, including public input and highly complex data
- Researched best practices and applied them in real world settings
- Informed budget process to maximize service within each municipality

Transit Planner — 3/2014 - 5/2016
Michiana Area Council of Governments, South Bend, IN

- Planned, implemented, and monitored transit service for region
- Managed large projects such as multi-million dollar bus procurement, bus tracking, and others
- Provided customer service to educate public on services provided and took complaints
- Tracked and reported on active grants
- Created reports for board members, elected officials, and public

KEY SKILLS

- Transit and Urban Planning
- ArcGIS
- Data collection and analysis
- Community Engagement
- Project management
- Geospatial Analysis
- Public Speaking
- Compliance

CERTIFICATES AND TRAINING

- Financial Management Oversight
- NTD Reporting (Federal Data Report)
- Triennial Review Workshop (Federal Audit)
- Understanding the ADA
- Bus Stop and Facility Accessibility
- FTA Real Estate Requirements

Policy

Southern Research is committed to ensuring that all employees are given the opportunity to express and resolve any concerns or dissatisfactions related to their employment without fear of penalty or reprisal. Supervisory personnel at all levels are responsible for implementing this policy by giving prompt consideration to issues brought forth by employees under their supervision, and by taking appropriate action to resolve complaints in a prompt, equitable manner.

Employees are encouraged to discuss problems with their immediate supervisors, and to use the dispute resolution procedure outlined below only in the event that the supervisor cannot resolve the problem to the employee's satisfaction. In general, the dispute resolution procedure should be used only to resolve a problem that affects the employee as an individual. If an employee wishes to express dissatisfaction with a policy or practice that also affects other employees, he or she should contact Human Resources.

Issues pertaining to salary, performance appraisal, verbal counseling, decisions related to intellectual property payments, or discharge may **not** be included under this policy unless supported by specific allegations of illegal discrimination. In addition, employees may not request a dispute resolution during their first six months' orientation / probationary period unless the employee's complaint is supported by allegations of discrimination. This policy does not apply to any report of harassment. Any report of harassment must be made in accordance with Topic 630, Harassment.

Procedure

The employee should first discuss the problem with his or her immediate supervisor. The supervisor will be responsible for taking appropriate action to resolve the problem within five working days. If the immediate supervisor cannot resolve the problem, or it the employee is not satisfied with the supervisor's solution, the employee may file a written report with the Director of Human Resources who, depending upon the circumstances, may request additional information.

The Director of Human Resources is responsible for convening a dispute resolution committee, composed of persons who the Director feels are appropriate to the issue. The employee requesting dispute resolution and persons named in the complaint may not participate in or have any input into the selection of persons who are to serve on the committee. The Director of Human Resources and the dispute resolution committee will convene within five working days of the Director's receipt of the written complaint; all parties may be asked to meet with the committee members and/or may address the committee in order to present their positions pertaining to the specifics of the complaint. Additionally, witnesses may be requested to present their testimony to the committee.

The dispute resolution committee will make a decision and submit its findings, in writing, to all parties named in the written complaint, as well as to the employee who submitted the complaint, within five working days of the final committee meeting. If additional time is necessary, the committee will notify all parties of the reason(s) for the delay and need for additional time. The committee's findings will become a permanent written document to be maintained in the personnel file of the employee who requested dispute resolution.

Occasionally, an employee may feel that a problem cannot be discussed with the immediate supervisor. In such cases, the employee may discuss the problem with a higher-level supervisor or ask a representative of Human Resources to provide assistance in presenting the problem to the appropriate supervisory individuals.

Related Topics
Open Door Policy
Harrassment

Manifest for Grant Application # GRANT13580445

Grant Application XML file (total 1):

1. GrantApplication.xml. (size 28805 bytes)

Forms Included in Zip File(total 6):

1. Form ProjectNarrativeAttachments_1_2-V1.2.pdf (size 16044 bytes)

2. Form SF424_3_0-V3.0.pdf (size 24296 bytes)

3. Form SF424A-V1.0.pdf (size 23162 bytes)

4. Form EPA4700_4_3_0-V3.0.pdf (size 22910 bytes)

5. Form OtherNarrativeAttachments_1_2-V1.2.pdf (size 16012 bytes)

6. Form EPA_KeyContacts_2_0-V2.0.pdf (size 37346 bytes)

Attachments Included in Zip File (total 9):

1. OtherNarrativeAttachments_1_2 OtherNarrativeAttachments_1_2-Attachments-1242-Open-Door-Policy.pdf application/pdf (size 66326 bytes)

2. OtherNarrativeAttachments_1_2 OtherNarrativeAttachments_1_2-Attachments-1241-Dispute-Resolution-13April2020.pdf application/pdf (size 76912 bytes)

3. OtherNarrativeAttachments_1_2 OtherNarrativeAttachments_1_2-Attachments-1238-JCDH_Letter of Support_EPA OAQPS AQ Monitoring Proposal 3-25-22.pdf application/pdf (size 36981 bytes)

4. OtherNarrativeAttachments_1_2 OtherNarrativeAttachments_1_2-Attachments-1235-Southern Research IRS Exemption Status Ltr 2017AUG07.pdf application/pdf (size 423832 bytes)

5. OtherNarrativeAttachments_1_2 OtherNarrativeAttachments_1_2-Attachments-1237-EPA OAQPS Enhanced AQ Monitoring - Birmingham - QA Statement.pdf application/pdf (size 58686 bytes)

6. OtherNarrativeAttachments_1_2 OtherNarrativeAttachments_1_2-Attachments-1240-EPA OAQPS Enhanced AQ Monitoring - Key Personnel - Yuill_SeniorPlannerresume.pdf application/pdf (size 54962 bytes)

7. OtherNarrativeAttachments_1_2 OtherNarrativeAttachments_1_2-Attachments-1239-EPA OAQPS Enhanced AQ Monitoring - Key Personnel - McQuilling_Project lead-resume.pdf application/pdf (size 124667 bytes)

8. OtherNarrativeAttachments_1_2 OtherNarrativeAttachments_1_2-Attachments-1236-Mayor Woodfin_Letter of Support_EPA OAQPS Enhanced AQ Monitoring_Southern Research.pdf application/pdf (size 603209 bytes)

9. ProjectNarrativeAttachments_1_2 ProjectNarrativeAttachments_1_2-Attachments-1234-EPA OAQPS Enhanced AQ Monitoring - Southern Research Birmingham - final.pdf application/pdf (size 550624 bytes)

Enhanced Air Quality Monitoring for Communities: Understanding and Evaluating Neighborhood-level variation in criteria pollutant levels in North Birmingham and Birmingham's West End

RFA NUMBER:	EPA-OAR-OAQPS-22-01
Assistance Listing No:	66.034
Applicant Organization:	Southern Research, Energy and Environment Division 2000 Ninth Ave S Birmingham, AL 35205
Primary Point of Contact:	Alyssa McQuilling Phone: 205-581-2266 Email: amcquilling@southernresearch.org
Set-Aside:	No set-aside.
Description of Applicant Organization:	Southern Research (SR), founded in 1941, is an independent, 501(c)(3) nonprofit, scientific research organization with more than 200 scientists and engineers working in the life sciences, energy, and environmental topics. SR supports the pharmaceutical, biotechnology, defense, environmental, and energy industries as we work on behalf of the National Cancer Institute, National Institutes of Health, the U.S. Department of Defense, the U.S. Department of Energy, utility companies, and other private and government organizations.
Project Partners:	City of Birmingham (Dept. of Planning, Engineering and Permits) North Birmingham Community
Project Location:	North Birmingham, Birmingham, AL (Zip codes: 35207, 35234) West End, Birmingham, AL (Zip codes: 35211, 35221)

Budget Summary:

EPA Funding Requested	Total Project Cost
$ 437,889	$ 437,889

Project Period:	36 Months (Estimated November 2022 – November 2025)
Short Project Description:	This project will monitor criteria air pollutant concentrations in two underserved neighborhoods in Birmingham, AL as well as monitor concentrations of key volatile organic compounds including naphthalene and benzene. The goal is to provide these communities with near-real time access to data on the quality of the air that they are breathing and better understand emission patterns and exposures.

II. Workplan

Section 1. Project Summary and Approach

Overall Project Summary

The City of Birmingham is home to a unique constellation of factors that has made it particularly vulnerable to the Covid-19 pandemic, including significant uninsured populations, disparities in income, large industrial point sources, and heavy traffic, which has exacerbated existing health disparities and air pollutant exposures in the metropolitan area.[1] In particular, the neighborhood groups that have been selected for this campaign have been studied in the past,[2,3] but these locations could benefit from sustained air quality monitoring and better public access to collected data. Past studies have focused on monitoring of air toxics (in 2005-2006, 2011-2012), and it will be important to investigate how recent changes in local sources, traffic and other factors have altered the exposure of these city residents in the years since those studies were completed as well as whether other remediation activities have altered the exposure of residents.[4]

This project proposes to use a combination of sensors that monitor particulate matter through nephelometry with single-particle scattering combined with gas sensors (for species including NO_x, SO_2, CO, and O_3) to build an observation network. Data will be stored on the cloud and community members will be able to see local air quality information in near-real-time. Additionally, a targeted measurement campaign will be conducted to build a better understanding of neighborhood exposure (i.e. North Birmingham and the area adjacent to the fuel tank storages in Industrial City and Jones Valley) to key volatile and semi-volatile compounds. Concerns around local exposure to key species, including benzene and naphthalene have been well-documented by the community, particularly for the study area in North Birmingham community comprised of the Acipco-Finley, Collegeville, Fairmont, Harriman Park, Hooper City, and North Birmingham neighborhoods.[5,6]

In response to these community concerns, the key objectives of the project will be to:

1. Better understand variability in air quality in neighborhoods that have been identified as bearing too great an air quality burden currently or historically or are near particular sources of concern
    - The project team will monitor air quality to understand day to day and seasonal variability over multiple years
    - The majority of sensors will collect size-resolved particulate matter data, but a selection will also incorporate gas sensors for key pollutants like NO_x, SO_2, and CO.

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[1] "U.S. Census Bureau QuickFacts: Birmingham city, Alabama." https://www.census.gov/quickfacts/birminghamcityalabama.

[2] US Environmental Protection Agency Region 4, "North Birmingham Air Toxics Risk Assessment," USEPA, Atlanta, GA, Final Report, Mar. 2013.

[3] S. Allen, et al., "The Search for Environmental Justice: The Story of North Birmingham," Int. J. Environ. Res. Public. Health, vol. 16, no. 12, p. 2117, Jun. 2019, doi: 10.3390/ijerph16122117.

[4] J. Benbrook and A. Saraiva, "In Three Predominantly Black North Birmingham Neighborhoods, Residents Live Inside an Environmental 'Nightmare,'" *Inside Climate News*, Aug. 06, 2021. https://insideclimatenews.org/news/06082021/in-three-predominantly-black-north-birmingham-neighborhoods-residents-live-inside-an-environmental-nightmare/

[5] US EPA, "North Birmingham Elementary School - Birmingham, AL | Assessing Outdoor Air Near Schools |," 2016. https://www3.epa.gov/air/sat/NorthBirmi.html; M. Hansen, "Toxic Birmingham: Power, Pollution and Corruption," *GASP*, Feb. 15, 2019. https://gaspgroup.org/toxic-birmingham-power-pollution-corruption/; D. Pillion, "Group says North Birmingham air tests show carcinogens," *al*, Jan. 24, 2020. https://www.al.com/news/birmingham/2020/01/environmental-group-reports-carcinogens-in-air-near-north-birmingham-coke-plant.html

[6] Regional Planning Commission of Greater Birmingham and City of Birmingham, "North Birmingham Community Framework Plan," Birmingham, AL, Final Report, Feb. 2015. [Online]. Available: https://www.birminghamal.gov/wp-content/uploads/2017/10/Appendix-F-North-Birmingham-Framework-Plan.pdf

- A third set of measurements will focus on targeted deployment of VOC sampling tubes[7] to collect information about the level of key VOC and some SVOC compounds in the identified neighborhoods

2. Work with community groups to engage with citizens and increase trust between the city and its constituents through data transparency.
   - The location selected for monitoring in the West End area of Birmingham is in close proximity to both a secondary school as well as a community college. As we begin this project we will engage students and faculty at local educational institutions to support the project efforts through data analysis and technical support of the project.
   - The North Birmingham neighborhoods are also home to a school and an active community group. Working with these individuals to site and monitor the performance of the sensors will be critical to building trust with the community members.
   - Plan for regular presentations of analyzed air quality data as well as training sessions on how constituents can access data via the cloud.
3. Investigate changes in pollutant concentrations since previous (shorter term) air quality studies were completed during the 2009-2013. We will use the data collected to try to identify changes in sources and think about how future changes in emissions and the climate may alter exposures in these adversely impacted communities.

Funding for the project will be used for the following items:

1. Project Labor (i.e. coordination and completion of research efforts); this includes the following activities:
   i. Time for project management and equipment procurement
   ii. Time for site visits, monitoring, and sensor installation and repair
   iii. Time for project data analysis, quarterly reports, publications
   iv. Time for community engagement, meetings, and trainings
   v. Payment for processing of VOC sampling tubes
2. Procurement of Air Quality Monitoring Equipment:
   i. Network of air quality sensors
      1. PM monitoring with various additional gaseous measurements (including CO, NOx, SO2, etc.)
      2. PM – monitors strictly PM (100nm to 10µm)
      3. Passive VOC samplers for integrated VOC sampling (capture average levels over a couple of weeks)—particularly to capture benzene and naphthalene
3. Cloud data storage, access and mapping tools associated with installed PM and gas sensors
4. Community engagement through:
   i. Payment for project site support
   ii. Local town-hall type events to share data and provide training on access to cloud-stored data;
   iii. Support of community data access
   iv. Support of additional analysis, consultation of local secondary and post-secondary educational institutions
   v. Collaboration with local community groups active in these neighborhoods

[7] E. Gallego, F. J. Roca, J. F. Perales, and X. Guardino, "Evaluation of the effect of different sampling time periods and ambient air pollutant concentrations on the performance of the Radiello diffusive sampler for the analysis of VOCs by TD-GC/MS," *J. Environ. Monit. JEM*, vol. 13, no. 9, pp. 2612–2622, Sep. 2011, doi: 10.1039/c1em10075k.

2. Project Significance

The level of air pollutants in the identified neighborhoods are among some of the highest in the country and are much higher than areas with higher median income and higher levels of education within the Birmingham metro area. Of particular concern in the identified neighborhoods are particulate matter and air toxics. The potential damages caused by air toxics have been investigated over the past two decades in a number of studies, but concerns remain within the community as a result of past handling of contamination in North Birmingham from a number of industrial facilities.[8]

Community members have highlighted the need for better monitoring of pollutants due to the perceived and observed health impacts on the community, especially respiratory, cardiovascular disease, and cancer impacts. In particular, community members have cited exposure to excessive criteria pollutants as well as VOCs (e.g. benzene, naphthalene) and other organic compounds.

As previously described, the following pollutants will be monitored through the completion of this effort:

- Particulate matter—coarse and fine PM, size resolved
- Gaseous (criteria) pollutants including SO_2, NO_x, CO
- Alternative sampling for VOCs to build on results previously collected by the local health department (in collaboration with the EPA) and the University of Alabama in collaboration with the Greater-Birmingham Alliance to Stop Pollution (GASP)[9]

Through the efforts described in the workplan, the research team proposes to:

a. Quantify the extent of the problem: additional monitoring will help city and/or Department of Health identify areas where folks are exposed to excessive pollutants
b. Provide access such that community members will be able to see near-real-time data about the outdoor air quality at their residence; the proposed network of sensors will provide additional coverage that current monitors may not capture. The aim of this is to help rebuild trust between the city, the department of health and community partners.
c. Work with educational institutions in the city to expose students to real-world environmental monitoring and spark interest in future efforts, involvement in continued monitoring of air quality within underserved communities in Birmingham.

The proposed work will take in two neighborhood areas in Birmingham—one in North Birmingham (Acipco-Finley, Collegeville, Fairmont, Harriman Park, Hooper City, and North Birmingham neighborhoods) and the other in West Birmingham (comprised of parts of Jones Valley, Industrial Center, and Garden Highlands). Constituents in both locations are concerned with criteria pollutants as well as selected VOCs and other organic compounds. In particular, in West Birmingham, a collection of fuel storage tanks is a potential source of some of these compounds. These locations are highlighted in the map below; the map on the left shows the Birmingham-Hoover metro and the right shows the areas of interest in this study.[10]

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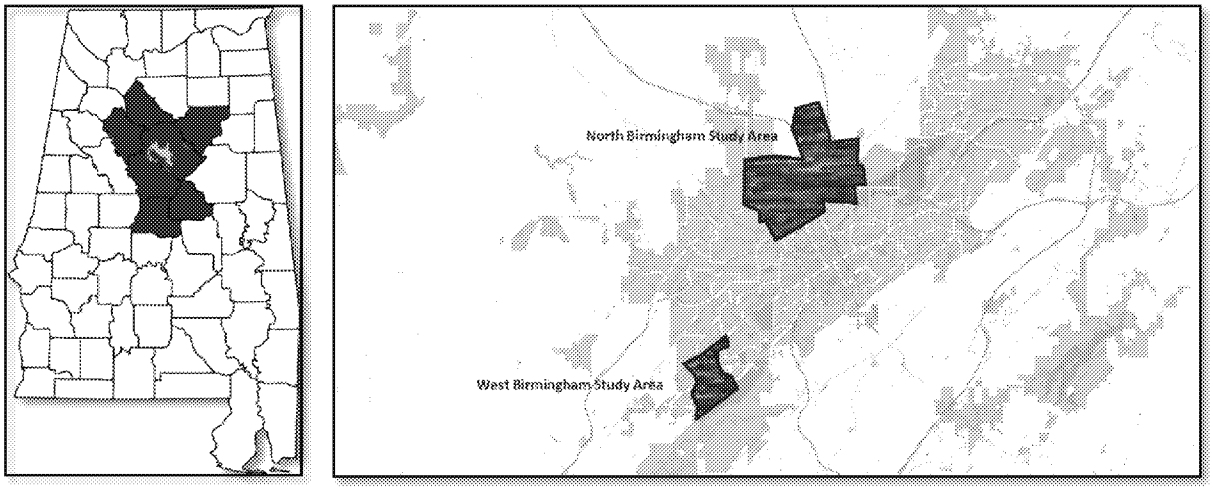
[8] J. Yang, "Birmingham Bribery Trial Ends, but Who Should Pay for the 35th Avenue Superfund Site?," Oct. 04, 2018. https://www.law.georgetown.edu/environmental-law-review/blog/birmingham-bribery-trial-ends-but-who-should-pay-for-the-35th-avenue-superfund-site/; Dennis Pillion, "North Birmingham's 35th Ave EPA Superfund site explained - al.com," May 2017. https://www.al.com/news/birmingham/2017/05/north_birmingham_35th_ave_superfund.html

[9] Jefferson County Department of Health, "Air Program Reports," 2021. https://www.jcdh.org/SitePages/Misc/AirProgReports.aspx; T. Spencer, "About 50 people attending meeting on air pollution in northern Birmingham," al, Dec. 13, 2011. https://www.al.com/spotnews/2011/12/about_50_people_attending_meet.html

[10] https://commons.wikimedia.org/wiki/File:Birmingham-Hoover,_Alabama_Metropolitan_Statistical_Area.svg; https://simplemaps.com/city/birmingham/zips



Based on preliminary review of information from the Toxics Release Inventory (TRI) Search which retrieves data from the TRI database in Envirofacts,[11] there are a number of point sources for both North and West Birmingham. Additional sources of pollutants include traffic emissions from nearby interstates. Sources in identified zip codes are listed below from the most recent TRI forms reported.

a. North Birmingham (35207)
    i. Industrial Point Sources include:
        1. American Cast Iron Pipe Co
        2. Bluestone Coke
        3. CMC Rebar
        4. Ready Mix USA LLC
        5. Western International Gas & Cylinders
    ii. Traffic/Highway
        1. I-20/I-59
        2. I-65
b. West End/Garden Highlands/Industrial City (35221)
    i. Industrial Point Sources include:
        1. Ready Mix USA LLC
        2. Motiva Enterprises, Marathon Petroleum, Penn Tank Lines, Allied Energy

The demographics of the neighborhoods that will be included in this work are described using information from both the Census Bureau and EPA's EJ Screening tool.[12]

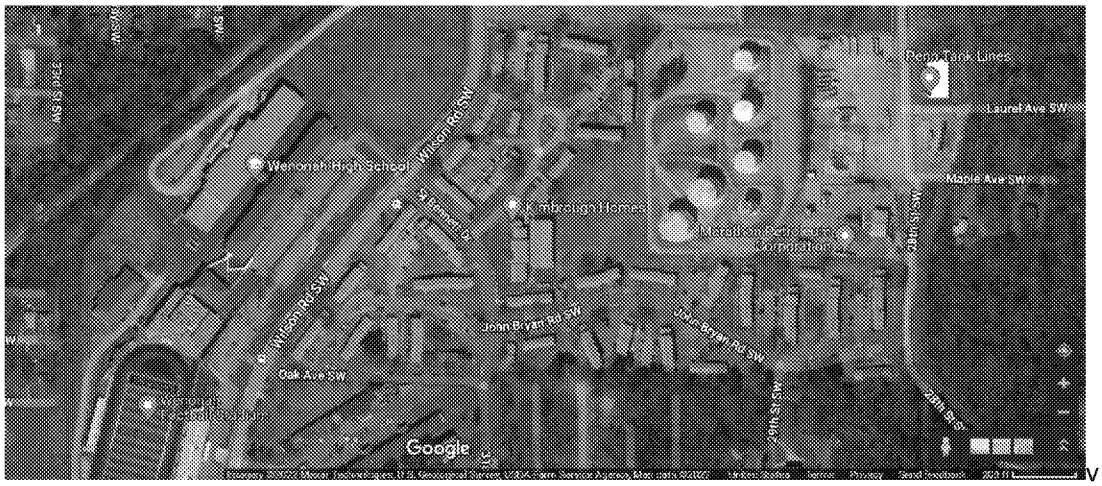
The North Birmingham neighborhoods have a greater proportion of people of color, low income residents, and higher unemployment than surrounding neighborhoods and Birmingham at large. Specifically, North Birmingham falls in the 96th percentile in people of color and 95th percentile for low income; this results in a demographic index of the 97th percentile. The unemployment rate for these neighborhoods is high, falling in the 91st percentile compared nationally and 88th percentile relative to the rest of the state according to the data in EJScreen.

[11] US EPA, "TRI Search," Sep. 03, 2015. https://www.epa.gov/enviro/tri-search

[12] "Overview of Demographic Indicators in EJScreen," Oct. 21, 2014; https://www.epa.gov/ejscreen/overview-demographic-indicators-ejscreen (accessed Mar. 21, 2022); US EPA, "EJScreen," 2022. https://ejscreen.epa.gov/mapper/; "U.S. Census Bureau QuickFacts: Birmingham city, Alabama." https://www.census.gov/quickfacts/birminghamcityalabama

The neighborhoods in the West End of Birmingham in the proposed study include portions of Jones Valley, Industrial Center, and Garden Highlands. Similar to the North Birmingham community, this area is home to a greater proportion of people of color and low-income residents when compared to state, national, or the city as a whole. Specifically, this area ranks in the 93rd percentile for people of color, 90th percentile for low income, 92nd percentile for unemployment and 74th percentile for fraction of residents with less than a high school education.

The demographics of these communities have resulted in their neighborhoods being subjected to disproportionate pollutant emissions in comparison to the rest of the Birmingham metro. Of particular concern for these locations is their proximity of these sites to schools and community centers as well as subsidized housing developments like Kimbrough homes. The photograph below highlights how close the fuel storage tanks are to the Kimbrough Housing Authority development in Birmingham; additionally, the Wenonah High School campus is only a few hundred feet away from these storage tanks.[13]



Section 2. Community Involvement

A. Community Partnerships

In addition to providing the Birmingham community with greater access to high quality air monitoring data, one of the critical aims of the proposed work is to build community trust and engagement in the monitoring process. The roles of each partner as well as their experience with air quality monitoring are described in the following sections.

Southern Research (SR) will lead equipment procurement, project coordination, data analysis, and reporting. The staff from SR has significant experience in both air quality research as well as project management. The lead staff member from SR received their doctorate degree in Civil and Environmental Engineering with a dissertation focused on understanding ammonia emissions from livestock production and experience with particulate matter formation and modeling through her work at the Carnegie Mellon University Center for Atmospheric Particle Studies.[14] Building on a network of experience partners, they will be able to develop equipment specifications, monitor performance and work with suppliers to provide the most cost-effective. Additionally, work done by SR will be supported by its full administrative teams,

[13] Google Maps. https://www.google.com/maps/@33.4546219,-86.883232,574m/data=!3m1!1e3?hl=en (accessed 3.21.22)
[14] Center for Atmospheric Particle Studies. https://particulate-matter.cmu.edu. 2020; McQuilling, Alyssa (2018): Ammonia Emissions from Livestock in the United States: From Farm-Level Models to a New National Inventory. Carnegie Mellon University. Thesis. https://doi.org/10.1184/R1/6714665.v1

including its contracts, procurement, facilities, and executive team members. The SR team will also lead reporting activities—both for quarterly reports as well as the program's final assessment report.

The team from the City of Birmingham's Department of Planning, Engineering and Permits brings extensive experience in collaborating with constituents and leading programs and implementation. They will lead engagement with the North Birmingham Community and will support the extensive efforts by the team from SR. They are already actively involved in the North Birmingham and West Birmingham communities. The city's Comprehensive Plan (adopted in 2013) recommended creation of Framework Plans for the city's communities in order to apply the goals, policies and strategies of the Comprehensive Plan to the specific conditions in each community. Community Framework Plans were adopted for the North Birmingham and Southwest Communities in 2015 and 2017 respectively. After Plan adoption, Planning Staff worked with community leaders to establish Implementation Committees (IC). These Committees are tasked with carrying out the goals, strategies and actions of the Framework Plans. Planning Staff meets routinely with the ICs and connects ICs with other agencies or departments that can assist in achieving the implementation goals.

The community groups involved, in particular the North Birmingham Community group, bring a depth of interest and commitment to characterizing and improving their residential air quality to improve community quality of life. Their commitment to involvement in prior studies has been well-documented and they are eager to engage. In addition to helping the team identify locations and site monitors, they will be empowered to critically review the data collected from local monitors.

Academic groups will be utilized to support the analysis of sampled volatile and semi-volatile organic compounds. There are exceptional research capabilities at a number of local institutions. Additionally, we will connect with Wenonah High School, adjacent to the West Birmingham site, in order to build interest in environmental monitoring at the secondary education level. Students will be able to access monitoring data and can be incorporated in their math and science curricula.

The desire of the collaboration is to continue the monitoring program beyond the study length; significant expenditures of the program will be for the initial purchase of monitors. Through prudent management, maintenance and a budget for minor repairs, we expect the monitors to function well beyond the window of the study. We will pursue funding at the state and federal level, perhaps in collaboration with ongoing work focused on minority health disparities at the University of Alabama at Birmingham. We expect that there will be substantial interest in this data set as environmental exposure to pollution is one key factor driving health disparities in Birmingham and Alabama and the United States more broadly.

B. Community Engagement:

The proposed work will involve community engagement at every point in the process—from determining the siting of air quality monitors, to determining the VOCs and SVOCs of greatest concern, to community members having access to the data for review and analysis. Additionally, we have incorporated into our proposal regular community townhall meetings to discuss project progress and results as well as provide training to community members and students to empower citizens with their own access to the collected air quality monitoring data. As part of the cloud data services, there will be not only access to raw data but the services we have investigated all provide a variety of visualization tools to automatically begin the data analysis process. Through open access to data, we provide the opportunity for critical review by the community to ensure that our work is done in a way that provides meaningful benefits to Birmingham residents and students.

Section 3. Environmental Justice and Underserved Communities:

The neighborhoods that are proposed to be monitored in this application among the most underserved in the United States and have been exposed to significantly worse air quality and more environmental hazards than most locations in the country. Exacerbating these heightened environmental exposures is both a lower rate of insured residents and resulting limited healthcare access. Over the past two years, during the COVID-19, health disparities were revealed even further, Jefferson County, in which Birmingham is located, experienced a COVID-19 death rate of 253 per 10,000 residents, 29% higher than the national average. These factors highlight the ways in which the city has disproportionately suffered over the past years and demonstrates the potential benefits to constituents to better monitor air pollutants of greatest concern within these communities.

Pulling data for the proposed study sites from the EJScreen tool by census tracts and zip code, we observe both the greater proportion of low-income, people of color, and less than high school educated citizens relative to both the city, state and country. Additionally, when considering the environmental indicators, we see these vulnerable populations are also those which are highly exposed to a wide range of environmental contamination—from air, soil, and water. Specific data are included below.[15]

Environmental or Demographic Indicator	North Birmingham			Southwest Birmingham		
	Value	Percentile in Alabama	Percentile in USA	Value	Percentile in Alabama	Percentile in USA
Particulate Matter 2.5 (µg/m3)	9.89	96	81	9.91	97	82
Ozone (ppb)	43.2	99	60	42.5	89	52
2017 Diesel Particulate Matter (µg/m3)	0.587	98	90-95th	0.381	87	70-80th
2017 Air Toxics Cancer Risk (risk per MM)	44	99	95-100th	40	99	95-100th
2017 Air Toxics Respiratory HI	0.6	99	95-100th	0.5	91	95-100th
Traffic Proximity (daily traffic count/distance to road)	1600	97	89	41	34	20
Lead Paint (% pre-1960s housing)	0.66	96	86	0.51	92	78
Superfund Proximity (site count/km distance)	1.1	99	98	0.073	80	55
RMP Facility Proximity (facility count/km distance)	1.5	94	85	2.8	98	94
Hazardous Waste Proximity (count/km distance)	2.7	93	77	2.4	91	74
Underground Storage Tanks	3.2	83	68	1.8	72	56
Demographic Index	82%	96	96	75%	93	93
People of Color	98%	96	96	98%	96	95
Low Income	65%	90	92	52%	77	82
Unemployment Rate	12%	85	89	18%	94	96
Linguistically Isolated	0%	70	45	0%	70	45
Less Than High School Education	19%	72	77	11%	47	59
Under Age 5	5%	39	37	6%	52	51
Over Age 64	28%	92	91	18%	60	65

The proposed work will provide a first step towards repairing the environmental burden that has been disproportionately borne by these communities, particularly as it relates to exposures to atmospheric pollutants including particulate matter. In order to work resolve these health disparities, we first need to characterize the particular exposures of these citizens and quantify the scale of the problems faced. By providing public access to air quality data and providing training to ensure citizens can leverage this information, the project aims to empower community members as they continue to push for better air quality in their neighborhoods.

[15] US EPA, "EJScreen," 2022. https://ejscreen.epa.gov/mapper/

Section 4. Environmental Results—Outcomes, Outputs and Performance Measures

A. Expected Project Outputs and Outcomes:

Per the RFA, "the term "output" means an environmental activity, effort, and/or associated work product related to an environmental goal and objective that will be produced or provided over...the assistance agreement funding period."[16] They can be qualitative or quantitative. The primary outputs of this endeavor are as follows:

- Highly spatially and time-resolved measurements of particulate matter and gaseous pollutants in identified study areas
- Data access for these pollutants in near-real-time via access to cloud stored air quality data
- Continued programming to engage community members and build relationships between the researchers, city and residents through direct support for monitor siting
- Progress reports and a final assessment report will be supplied for the proposed work in accordance with the reporting requirement described in the RFA.

Outcomes from the proposed efforts describe the results, effect or consequence of the proposed research study. The short-term outcomes of this work will result in increased community awareness and knowledge about particulate matter, criteria pollutant and other key organics; through the proposed cloud data access, citizens will also have greater access to information about potential environmental and human health risks. Taking a longer-term view, information collected during the study will be provided to local regulatory authorities to supplement existing monitoring sites and identify locations where additional protective actions may be needed.

Additionally, data will be shared with researchers at the University of Alabama at Birmingham within the Minority Health & Health Disparities Research Center. Work at this center focuses on gaps in health outcomes between the general population and groups of people who experience systematic obstacles to health based on their race or ethnicity, socioeconomic status, geographic location (including excess exposure to environmental pollution and contamination), or other characteristics linked to exclusion. Community outreach is also critical to their efforts as they work to identify urgent health questions and needs and implements evidence-based strategies to reduce health disparities and promote health equity.[17]

B. Performance Measures and Plan:

In order to accomplish the proposed projects outcomes and outputs, there must be keen oversight of the project budget expenditures, sub-contractor performance, procurement, installation and maintenance of PM and gas monitoring equipment as well as reporting and analyzing collected data and sharing with community stakeholders. Specifically, the project lead will monitor monthly project expenditures in collaboration with the accounting department, and will include a summary of the financial status of the project in each quarterly report. Building on preliminary research efforts to find the best supplier and data service for the proposed PM and gas monitoring network, we will develop specification for the required equipment and review with key stakeholders. Data will be reviewed on a weekly basis to ensure that there were no gaps in data collection. Due to the nature of cloud storage, many stakeholders will be able to access and monitor collected data.

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[16] US EPA, "Enhanced Air Quality Monitoring for Communities," 2022. https://www.grants.gov/web/grants/view-opportunity.html?oppId=336951 (accessed Mar. 21, 2022).

[17] UAB, "School of Medicine - Minority Health & Health Disparities Research Center," 2022. https://www.uab.edu/medicine/mhrc/

C. Timeline and Milestones:

The following Gantt chart highlights key milestones throughout the execution of the proposed monitoring campaign to serve North and West Birmingham. The specification and procurement process will begin immediately after funding with the goal of purchasing sensors and engaging with local community stakeholders no later than the second quarter of the first year of the project.

Subsequently, the network of monitoring sites will be determined and measurement of air quality characteristics will begin. At this point we will also begin the deployment and analysis of passive samplers for observation of key volatile organic compounds in these communities, particularly benzene and naphthalene.

Description	Year 1				Year 2				Year 3			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Begin bid and procurement for sensors												
Purchase PM sensors												
Initial meeting of community stakeholders												
Site selection for monitors based on community feedback and requirements for monitors												
PM and criteria gas monitoring												
Make plan for VOC measurement campaign												
Intermittent VOC monitoring												
Community meeting: Reporting of results												
Training for data access within community												
Quarterly Update Memos												
Securing of follow-on funding from community stakeholders to support continued monitoring of study areas												
Final Project Report												

Section 5. Quality Assurance Statement:

In order to provide credible data for the proposed air quality monitoring project, particular care must be used when handling the data. In order to ensure quality data, the equipment and sensors must first be properly calibrated and maintained. The second aspect is to double check all the data that is collected for consistency and for reasonableness to identify if one of the deployed devices is not functioning as expected.

The project staff from SR will work with the air quality monitor supplier to set up and calibrate the equipment according to all required procedures and protocols necessary to ensure the accurate capture of data. Additionally, VOC sampling will be done according to EPA protocols and procedures (e.g. Method 325A). Further details related to quality assurance are available in the additional attachments.

Section 6. Programmatic Capability and Past Performance

A. Past Performance:

Both SR and the City of Birmingham have had substantial experiences with assistance agreements (i.e. grants and cooperative agreements) across the organizations; administrative divisions across the institutions are well set-up to monitor and support the successful completion of grants and cooperative agreements. A few highlights from the past few years include:

- Under grant number: 1R01DA047924-01A1, funded by NIDA and NIH, Southern Research is investigating "Allosteric Modulators of Dopamine Transporter as Therapeutic Agents for NeuroAIDS;" the grant's period of performance runs from July 2020 through April 2025. The project is ongoing but work is being successfully managed by the life sciences team under the leadership of the VP for Platform Sciences.
- A grant from the Breast Cancer Research Foundation of Alabama for the "Development of novel Clofarabine analogs for breast cancer therapy;" work was initiated by Southern Research in 2020 and will conclude at the end of 2022.
- Another ongoing study by Southern Research is under grant number 5U19AI142759-03 entitled the "Antiviral Drug Discovery and Development Center" funded by NIAID and NIH from 2019 through 2024. This project is being successfully jointly managed by the life sciences team at Southern Research and its external partner, UAB.
- The City of Birmingham was a part of "Greening America's Communities," a program that helped the Collegeville Neighborhood develop a vision for a park that incorporated green infrastructure specifically targeted to help the neighborhood reduce flooding. The program included a design team who held a series of charrettes to meet with local stakeholders. The end product was a conceptual plan for "Shuttlesworth Memorial Park" – a greenspace that would provide for sustainable development while also connecting the neighborhood to a civil rights national landmark, Historic Bethel Baptist Church.
- The City of Birmingham also participated in the Building Blocks for Sustainable Communities program. This program provided technical assistance that was focused specifically on providing tools to address the challenges faced by the North Birmingham community. Online workshops provided stakeholders and city leaders an opportunity to discuss specific challenges and brainstorm possible solutions to those problems. The end result was a targeted "playbook" for next steps the community can take to achieve its goals.

B. Reporting Requirements:

For each of the agreements listed, Southern Research and the City of Birmingham expect to provide the proposed deliverable on schedule and on budget.

C. Staff Expertise:

Southern Research (SR) has a decades long history of work in the environmental monitoring space including work develop and test air and water emissions control technologies for leading electric power utilities, industrial manufacturers, municipal water utilities, and related trade organizations. The lead staff member from SR holds a doctoral degree in Civil and Environmental engineering having done extensive work on modeling air emissions and building emissions inventories. She is well-connected to a number of experts in the air quality modeling field and has already investigated several suppliers for all of the equipment that will need to be procured for the completion of the project.

The primary staff members from the City of Birmingham hold Master's degrees in public administration and have significant experience in project management, grants administration, permitting and planning. Previous experience with the administration of EPA-funded grant programs (as detailed above) will be particularly helpful in the execution of the proposed effort. Additionally, they have built extensive relationships with local community organizations, including neighborhood organizations through the execution of programs in the North Birmingham and Southwest Birmingham communities proposed as study sites in this work.

Key personnel resumes are also included among the optional attachments of this submission.

Section 7. Budget

A. Budget Detail:

The following table summarizes the expenses associated with the completion of the proposed work including details of government negotiated labor rates, and estimates of service and equipment costs based on preliminary quotes and pricing. Specific details are subject to change.

Line Item and Itemized Cost	EPA Funding
Personnel	
(1) Project Lead @ $51.44/hour x 6.4hrs/wk x156 wks	$ 51,444
Benefits for project lead at 44.2% of hourly rate	$ 22,738
TOTAL PERSONNEL	**$ 74,182**
Overhead and G&A	
Overhead (120% of personnel)	$ 89,018
G&A (20% of labor, equipment and services)	$ 72,044
TOTAL OVERHEAD AND G&A	**$ 161,062**
Supplies	
PM monitor x 20 (with 3% escalation)	$ 26,687
PM + Gas monitors x 8 (with 3% escalation)	$ 44,835
Solar + battery support kits x 28 (with 3% escalation)	$ 14,796
Cloud data service for 28 monitors for 3 years (with 3% escalation)	$ 26,901
Gas sampling tubes x 60 (with 3% escalation) with analytical support	$ 80,063
TOTAL SUPPLIES	**$ 193,282**
Outside Services	
Community Meeting Logistics	$ 3,736
OUTSIDE SERVICES TOTAL	**$ 3,736**
Cost of Capital	
Rate: 7.1% of Overhead Base	$ 5267.00
Rate: 0.1% of G&A Base:	$ 360.00
TOTAL COST OF CAPITAL	**$ 5,627**
TOTAL EPA FUNDING	**$ 437,889**

B. Reasonableness of Costs:

The rates cited in the budget detail are based on the federally negotiated rate for Southern Research. Costs for monitoring equipment have been estimated based on conversations with a number of equipment suppliers throughout the development of the proposal. We have attempted to maximize the impact of the project while minimizing costs through leveraging city and community support for the project. This will enable the group to magnify the potential impact of this work on the community. We have allocated funding for the purchase of a network of PM and PM and gas monitors that will have solar and battery support kits negating the need for a power supply for the monitor allowing for simpler community deployment.

C. Expenditure of awarded funds:

The project coordinator (from SR) will schedule monthly team calls to provide updates with respect to budget expenditures and planned expenditures for the coming month. Within SR, the project team will be supported by administrative staff in the contracts, procurement, and finance departments to maintain best practices with respect to budget management.

March 21, 2022

c/o: Reviewers for the Enhanced Air Quality Monitoring for Communities RFA
Environmental Protection Agency
Office of Air and Radiation
1200 Pennsylvania Ave NW
Washington, DC 20460

To whom it may concern:

I am writing to express our enthusiastic support for the proposal entitled "Understanding and Evaluating Neighborhood-level variation in criteria pollutant levels in North Birmingham and Birmingham's West End" written in response to the EPA's Enhanced Air Quality Monitoring for Communities Request for Applications.

The responding team, which is led by Southern Research and includes key personnel from the City of Birmingham, is aiming to empower community access to high quality, highly time resolved air quality data through a network of air quality sensors and cloud-stored data. The neighborhoods that this application proposes to monitor are among the most underserved in the U.S. More than 12% of Birmingham residents lack health insurance, limiting the availability of quality healthcare. The COVID-19 crisis further exacerbated public health disparities. Jefferson County, in which Birmingham is located, experienced a COVID-19 death rate of 253 per 10,000 residents, 29% higher than the national average. These factors highlight the ways in which Birmingham residents have disproportionately suffered over the past years and demonstrate the potential benefits of better monitoring air pollutants of greatest concern within these communities.

The proposed work offers the opportunity to strengthen both research collaborations and community relationships within Birmingham. The assembled team combines research expertise, academic, municipal, and community support. The potential to build trust through open data sharing of near-real-time air quality measurements for particulate matter empowers citizens and the city to protect public health. Additional efforts to monitor levels of key volatile and semi-volatile organic compounds will build on previous work completed in the city to better support underserved community members.

Southern Research, a non-profit 501(c)(3) research institute, is the lead applicant for this application to the Economic Adjustment Assistance program. Southern Research is acting in cooperation with officials of the City of Birmingham and is an eligible recipient for this grant per section 3 of PWEDA (42 U.S.C. § 3122) and 13 C.F.R. § 300.3.

As outlined in the grant application, I eagerly support this application for EDA support to Birmingham's Center for Pandemic Resilience, which will support long-term economic growth and pandemic preparedness. Thank you for your consideration of this proposal.

Sincerely,

Randall L. Woodfin,
Mayor

DEPARTMENT OF THE TREASURY
INTERNAL REVENUE SERVICE
PHILADELPHIA, PA 19255

CERTIFICATION
PROGRAM

Date: August 7, 2017

Taxpayer: SOUTHERN RESEARCH INSTITUTE
TIN: 63-0288868
Tax Year: 2017

I certify that, to the best of our knowledge, the above-named entity is an exempt organization under section 501(c) (3) of the U.S. Internal Revenue Code, or a religious or apostolic organization under section 501(d), which is exempt from U.S. taxation under section 501(a), and is a resident of the United States of America for purposes of U.S. taxation.

Joseph Dianto
Field Director, Accounts Management

Form 6166 (Rev. 6-2008)
Catalog Number 43134V